

# Proposal for Fabrication of Bespoke Large-Scale High-Quality Diamond Structures via Soliton Mosaic Component Annealing

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## **Introduction**

The lack of scalability of methods for the manufacture of synthetic diamonds and the high rate of defects in those processes, particularly with Microwave-Plasma Chemical Vapor Deposition has prevented the practical utilization of diamond on large scales.

Although diamond has a wide variety of potential applications, our primary application of concern is as a heat dissipation medium i.e. a “heat sink.” Scalable, affordable diamond heat sinks would be useful both in computer processors and for protecting hypersonic missiles and aircraft from the effects of atmospheric friction, given its ability to rapidly transport excess heat. There is literally no material with a greater coefficient of thermal conductivity. Traditionally, the application of a diamond shell to the skin of an aircraft or missile has never been considered practical for reason of the scale of the needed shell.

## **Abstract**

Previous approaches to the growth of synthetic diamonds have been predicated upon either the use of a homogeneous substrate i.e. natural diamonds used as seeds to guide the growth of synthetic diamond, or of a heterogeneous substrate. This author proposes that neither of these approaches is viable for the creation; at low cost; of structurally perfect bespoke 3-D structures.

This author proposes that synthetic seeds should be produced via a novel approach and that the synthetic seeds (‘seeds’ would be a misnomer as we are talking about annealing blocks) be annealed using the same process which created them: Soliton wave bombardment.

## **Synthetic 8-Atom Diamonds from Cookie Cutter Molds**

The first step in this proposed process would be the creation en masse of large numbers of the smallest possible diamond structures, eight atoms of carbon forming a cube. A large breadboard-like array of carbon traps would be created using a photo-lithography process in which each trap is precisely cubic and precisely large enough to accommodate eight discrete carbon atoms with a small amount of extra space to ensure ease of loading.

Once manufactured, these “cookie-cutter molds” would be filled with individual carbon atoms and a cover would be placed on the board featuring tampers which align precisely with the opening of each individual trap, which would serve to exert a slightly positive pressure on the carbon atoms. The

traps would be made of metal and thus designed to expand when heated, thereby making their spatial dimensions tunable through thermal titration. The tamper array lid would be closed and the board would be heated to a precisely controlled temperature which would push against the carbon atoms and ensure, despite our not being able to observe them, that they must be in the proper position. Like a cookie-cutter mold, knowing the size and shape of the mold allows us to know the size and shape of the thing we are manufacturing. In other words, the carbon atoms would be held by the walls of the trap in a position which is consistent with the positions of carbon atoms in a diamond despite existing as discrete atoms which are not liganded to the others.

A soliton emitter as previous described by in many publications by this author (ibid.) would then be used to bombard the carbon atoms so as to encourage liganding, even in the absence of significant pressures or temperatures. It stands to reason that if soliton waves are useful for elemental transmutation, they should be able to encourage chemical bonds (and, in fact, this author has proposed this as a generality many times in the past.)

By starting with the smallest possible size of diamond; eight carbon atoms; these diamonds can act as three-dimensional mosaic tiles (truly, cubes,) which, rather than being supplemented through a vapor deposition process, can be annealed with one another using subsequent bombardment with more soliton waves. This has some parallels with the so-called "mosaic" method, except we would be chemically joining whole mosaic tiles (cubes) together, rather than augmenting a merely collocated mosaic of diamonds one atom at a time.

This behavior of chemicals can be predicted to be so because soliton waves are magnetic monopoles but also have the properties of a magnetic vortex. They are capable of subsuming ambient photons and electrons and moving them a distance and re-depositing them in a different area. As a practical matter, in this application, our goal is to take the electrons in the electron cloud of one set of atoms of carbon and to get them to synchronize (very much like in a so-called time crystal) with those the neighboring cube of diamond. In chemical bonding, temperature is often correlated with the process of creating bonds because higher temperatures and pressures give rise to proximity. Proximity gives rise to Coulomb effects which ultimately give rise to the establishment of correlations in the patterns of movement of electrons in the chemicals. Attempts to establish Carbon-Carbon bonds teach us that chemical bonds are fundamentally based upon temporal synchronizations of patterns of energy.

The valence electrons can be thought of as hooks which much catch one-another in order for the strong Carbon-Carbon bonds associated with diamond formation to be established. Soliton waves are incredibly useful for encouraging chemical bonds such as Carbon-Carbon bonds because these waves encourage the commingling of electrons in neighboring atoms through transient conflation of neighboring electron clouds. What would ordinarily require time and pressure can be achieved rapidly using these structured EM waves.

This effect cannot be produced using a simple electromagnet because the activation of an external electromagnet would not meaningfully change the position of the individual electrons, although it might change their spin-orientation. Soliton waves are uniquely suited for dragging electrons a short distance from their usual orbits and, unlike in the phenomenon of ionizing radiation, not entirely removing the electrons, but merely temporarily relocating them to a more distant orbit wherein they may interact with neighbors, thereby creating rhythmic synchronization with neighbors which form the basis of these chemical bonds.

### **Precision Soliton Bombardment from Opposing Directions**

It stands to reason that if soliton waves carry electrons temporarily into higher orbits and in the direction of angular momentum of the waves, this effect could be best-leveraged to create Carbon-Carbon chemical bonds by placing two soliton emitters a precise distance from one-another and placing the joint between the two existing diamond cubes precisely in the center. Subsequently, soliton waves would be emitted from opposing directions with a slightly offset timing; on the order of picoseconds; in order to push electrons from one atom far enough from their usual orbit that they dip under the standard orbital "altitude" of the electrons from the other and so that this effect is mutual between the two. This overall strategy could be employed both in the manufacture of the mosaic pieces and the annealing process which allows the pre-manufactured cubes to be joined like toy blocks into any desired shape.

### **Mosaic Component Annealing**

Once these nanoscopic diamonds are manufactured in the needed quantities (this would be an inhalant hazard and would require special precautions to handle,) a method would need to be delineated for placing the mosaic cubes in position (alignment is critical for perfect diamonds.) The benefit of this method is that the individual mosaic components will, at least, be perfect. The handling of two-atom thickness blocks of diamond presents its own interesting engineering challenges.

### **Bond Formation Cascades Similar to Phase Transition Waves**

There is a special behavior of these crystals predicted by this author which may aid in simplifying the annealing process which has never before been observed due to our inability to observe these processes in real-time. If we were to take a series of a certain number of these cubes; let's say, for example, we stacked them 10x10x10 in three dimensions and we applied a modest external pressure to press those cubes together prior to bombarding the joints between the outermost two cubes with the prescribed pattern of solitons, successfully creating Carbon-Carbon bonds around the entire perimeter of the new cube formed by the sub-cubes, the interior cubes would, before long, form Carbon-Carbon bonds of their own in much the way that a phase transition wave moves through a liquid material which contains a great deal of latent heat but which is below the freezing point.

Anyone who has ever observed how the phase transition wave moves through such a liquid, such as sodium acetate freezing rapidly as a result of the introduction of phononic energy can visualize how chemical bonds in a crystal might cascade from the outside, in, particularly when a larger crystalline mass composed of a great many smaller crystals is collocated, slightly pressurized and when a bond is formed somewhere along the exterior of the overall structure.

## **Conclusion**

Many assumptions have been made by those creating synthetic diamonds over the years about natural diamond formation, including the idea that the formation of natural diamonds is merely a more dilatory version of their own artificial process. Synthetic diamonds do not closely resemble high-quality natural diamonds, which suggests that this assumption is specious. I propose that natural diamond formation is actually predicated upon the collocation of a number of highly imperfect carbon structures in which, at some point in the growth of the crystal, more perfect alignments of carbon atoms eventually occur perchance. Specifically required are perfect alignments in two dimensions along two perpendicular planes which form two of six facets of a larger cube, which, combined with pressure and time lead eventually to the formation of Carbon-Carbon bonds at the points where Coulomb Force Lines intersect like grid coordinates. This explains the rarity of diamonds as these lines have to match up perfectly. This is more likely over smaller distances and less likely over larger distances. Because the imperfectly aligned carbon structures are not strongly bound in the early stages of diamond formation (this hypothesis is somewhat different from the currently accepted hypothesis) their relative position can be forced over time to change and to “snap-in” to the cubic lattice configuration, with this configuration spreading like a phase transition wave through diamonds being naturally formed. Given sufficient time, the initial establishment of planar Carbon-Carbon bonds perpendicularly on two axes, forming a partial shell around imperfectly arranged carbon interior to the shell, exert a gradual straightening effect (similar to dental braces) upon the carbon atoms interior to those two “walls,” with the Coulomb forces acting like an iron pressing wrinkles out of a shirt over a scale of millions of years.

Large, high-quality natural diamonds are rare because the maximum possible size of a natural diamond is limited probabilistically by fact that the probability of two planar alignments of Carbon-Carbon bonds in two dimensions existing at the needed perfect right-angles relative to one another becomes logarithmically reduced as scale increases.

This understanding is important because it means that as we are manufacturing and annealing mosaic blocks of diamond, even if imperfections are somehow introduced through improper placement of the blocks, those imperfections could conceivably correct themselves, particularly provided that we ensure that larger scale cubes are left “open” on one facet and that additional soliton bombardment is employed so as to allow for correction of any errors in the lattice in a subsequent “finishing” step.